CLAIMS

1
2   1.   A method of creating one or more real-time interactive control and

3   communication software objects for use in connection with a computer and a machine

4   which communicate according to a standard communication protocol for process control,

5   the method comprising:

6   producing a display module which displays a graphical representation of a user

7   interface of the machine on a display of the computer;

8   associating the graphical representation of the user interface with at least one

9   control signal;

10   producing a control module to examine the graphical representation of the user

11   interface and the associated control signal;

12   producing a communication module to communicate the associated control signal

13   using the standard communication protocol for process control;

14   producing a framework module to interconnect functionally the display module,

15   the control module, and the communication module; and

16   merging the framework module, the display module, the control module, and the

17   communication module to create the one or more real-time interactive control and

18   communication software objects.

1   2.   The method of claim 1 wherein the step of producing the communication module

2   comprises producing the communication module to communicate using the standard

3   communication protocol for process control which comprises the Object linking and

4   embedding for Process Control (OPC) protocol.

1   3.   The method of claim 1 wherein the merging step comprises merging to create the

2   one or more real-time interactive control and communication software objects which

3   comprise objects insertable using standard object insertion techniques.

1   4.   The method of claim 1 wherein the merging step comprises merging to create the

2   real-time interactive control and communication software objects which comprise

3   ActiveX control objects.

1   5.   The method of claim 1 wherein the step of producing the control module

2   comprises producing the control module to examine the graphical representation of the

3   user interface and the associated control signal periodically.

1   6.   The method of claim 1 wherein the step of producing the control module

2   comprises producing the control module to examine the graphical representation of the

3   user interface and the associated control signal when a change in the graphical

4   representation of the user interface is detected.

1   7.   The method of claim 1 wherein the step of producing the control module

2   comprises producing the control module to examine the graphical representation of the

3   user interface and the associated control signal when a change in the associated control

4   signal is detected.

1   8.   The method of claim 1 wherein at least one of the producing steps comprises

2   utilizing a pre-fabricated software module.

1   9.   The method of claim 1 wherein the step of producing the display module

2   comprises producing the display module which displays the graphical representation of

3   the user interface of the machine utilizing a pre-fabricated software image of the

4   graphical representation.

1   10.   The method of claim 1 wherein the merging step comprises compiling the

2   framework module into a compiled module and linking the compiled module with the

3   display module, the control module, and the communication module to create the one or

4   more real-time interactive control and communication software objects.

1   11.   The method of claim 1 wherein the merging step comprises interpreting the

2   framework module, the display module, the control module, and the communication

3   module to create the one or more real-time interactive control and communication

4   software objects.

1   12.   A computer-readable medium on which is stored a computer program for creating

2   one or more real-time interactive control and communication software objects for use in

3   connection with a computer and a machine which communicate according to a standard

4   communication protocol for process control, the computer program comprising

5   instructions, which, when executed by a computer, perform the steps of:

6   producing a display module which displays a graphical representation of a user

7   interface of the machine on a display of the computer;

8   associating the graphical representation of the user interface with at least one

9   control signal;

10   producing a control module to examine the graphical representation of the user

11   interface and the associated control signal;

12   producing a communication module to communicate the associated control signal

13   using the standard communication protocol for process control;

14   producing a framework module to interconnect functionally the display module,

15   the control module, and the communication module; and

16   merging the framework module, the display module, the control module, and the

17   communication module to create the one or more real-time interactive control and

18   communication software objects.

1   13.   The computer-readable medium of claim 12, wherein the communication module

2   communicates using the Object linking and embedding for Process Control (OPC)

3   protocol.

1   14.   The computer-readable medium of claim 12, wherein the real-time interactive

2   control and communication software objects comprise objects insertable using standard

3   object insertion techniques.

1   15.   The computer-readable medium of claim 12, wherein the real-time interactive

2   control and communication software objects comprise ActiveX control objects.

1   16.   The computer-readable medium of claim 12, wherein the control module

2   examines the graphical representation of the user interface and the associated control

3   signal periodically.

1   17.   The computer-readable medium of claim 12, wherein the control module

2   examines the graphical representation of the user interface and the associated control

3   signal when a change in the graphical representation of the user interface is detected.

1   18.   The computer-readable medium of claim 12, wherein the control module

2   examines the graphical representation of the user interface and the associated control

3   signal when a change in the associated control signal is detected.

1   19.   The computer-readable medium of claim 12 wherein the display module utilizes a

2   pre-fabricated software image of the graphical representation.

1   20.   The computer-readable medium of claim 12 wherein the framework module is

2   compiled and linked with the display module, the control module, and the communication

3   module to create the one or more real-time interactive control and communication

4   software objects.

1   21.   The computer-readable medium of claim 12 wherein the framework module, the

2   display module, the control module, and the communication module are interpreted to

3   create the one or more real-time interactive control and communication software objects.